Ebey Island Restoration Feasibility Study

Draft Criteria for Scoring Restoration Project Alternatives

Presented to the Advisory Committee

22 June 2010

Washington Department of FISH and WILDLIFE

amec

Draft SCRE Criteria & Scoring Scheme

			Score			
Decision Factors	**Measurement**	**Deal Breaker**	**1 (lowest)**	**2**	**3**	**4 (highest)**
Size of Restored Area	• *Wetted Area at MHHW*		0 - 309 acres	310 - 619 acres	620 - 928 acres	929 - 1,237 acres
Amount of Fish Habitat	• *Wetted Area at MLLW*		(Wetted Area at MLLW)/(Wetted Area at MHHW) = 0 - 3%	(Wetted Area at MLLW)/(Wetted Area at MHHW) = 3 - 15%	(Wetted Area at MLLW)/(Wetted Area at MHHW) = 16 - 50%	(Wetted Area at MLLW)/(Wetted Area at MHHW) = 51 - 100%
Energetics/Exchange	• *Tidal Prism (Volume)*		None: negligible increase in tidal prism	A little: Calculated restored tidal prism is ranked in the lower 50% of the different scenarios	A lot: Calculated restored tidal prism is ranked in the top 50% of the different scenarios	Most: Calculated restored tidal prism is ranked in the top 3 of the different scenarios
Predicted long-term elevation distribution	• *Histogram of area per elevation, compared with associations between communities elevation ranges*		Monotypic elevation above or below intertidal zone	Monotypic elevation within intertidal zone	Bi-modal elevation distribution with intertidal flat and channel	Diverse range of elevations distributed across the intertidal and shallow subtidal zones
Connectivity to Total Fish Population	*How easily can juvenile fish find the site? What proportion of the population is likely to encounter the site? Do any fish passage barriers prevent access?*		Fish access to restored site from Ebey Slough; narrow dike breach	Fish access to restored site from Ebey slough; full or wide dike breach	Fish access to restored site from mainstem or Deadwater slough; narrow dike breach	Fish access to restored site from mainstem or Deadwater slough; full or wide dike breach

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Decision Factors	**Measurement**	**Deal Breaker**	**1 (lowest)**	**2**	**3**	**4 (highest)**
Complexity and Diversity of Habitats	• *Histogram of area per elevation; compared with associations between communities elevation ranges* • *Planting plans* • *Channel creation plans* • *Hydrodynamic model results*		Wildlife managed agricultural land with ditch drainage network	Subtidal: no plant growth expected; no channels	A few different plant communities restricted to small patches	Diverse assemblage of native plant communities across entire site; meandering dendritic channels present
Influence by Adjacent Land Uses	*Will adjacent land uses significantly affect the success of salmon recovery?*		Intense agriculture using lots of pesticides, fertilizers, manure, etc, that would significantly affect fishes' success	Moderately intense agriculture having moderate impact on the restoration project	Low-impact/organic agriculture having little to no impact on restoration project	Natural environment
Completeness of Restored Tidal Action	• *Percent of full tidal signal at relevant location*		Tide Gate Repair/ Barrier Removal; 0% - 25% of tidal amplitude outside levees	Dike Breach at One Location; 26% - 50% of tidal amplitude outside levees	Dike Breach at Several Locations, 51% - 75% of tidal amplitude outside levees	Full Dike Removal; 76% - 100% of tidal amplitude outside levees
Other Species: Birds	• *General change in predicted species composition based on bird guild associations with habitat types and predicted habitat types based on elevation*		Anticipate the possibility for "less desirable" bird species to displace native species	Anticipate less habitat opportunity for existing bird species	Anticipate somewhat greater habitat opportunity for existing bird species	Anticipate much greater habitat opportunity for a wide variety of bird species

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Decision Factors	**Measurement**	**Deal Breaker**	**1 (lowest)**	**2**	**3**	**4 (highest)**
Effects On or Due To Other Restoration Projects and Salmon Recovery Actions	*Project may adversely affect other restoration projects in the vicinity by altering the hydrology, causing a need for re-engineering that project.*	*Project will significantly affect other restoration projects, causing them to not function properly*	Project will have major impacts on other restoration projects, and may have to re-engineer them at significant costs so that they continue to function	Project will have minor impacts on other restoration projects, and may have to take inexpensive steps to ensure they continue to function	Project will have no affect on other restoration projects	Project will have a positive affect on other restoration projects
Water quality	• *Residence time*		> 5 days	3 - 5 days	1 - 2 days	< 1 day
Current Use	*Is the property being used for agriculture?*		Property is currently being used highly productive agriculture	Property is currently being used for moderately productive agriculture	Property is occasionally used for minor agricultural uses	No
Contiguity of Agricultural Land	*Will the project break up large, contiguous tracts of agricultural land or leave small, isolated parcels?*		Leaves small, isolated agricultural parcels	Leaves moderately sized, but isolated agricultural parcels	Does not break up large tracts of agricultural land	Helps consolidate smaller tracts into larger, contiguous tracts
Impacts of Restoration Project on Agricultural Uses	*Does the restoration project have negative, or positive, impacts on agriculture? Does it preclude certain uses? Or does it help create new agricultural opportunities?*		Project precludes continuation of all adjacent agricultural uses	Project precludes continuation of declining agricultural uses	Project has no effect on adjacent agricultural uses	Project has a positive affect on or helps create new agricultural opportunities

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Soil Suitability for Agriculture	*Conservation Service's soil classification*		Mukilteo muck, Puget Silty clay loam, Puyallup fine sandy loam, Snohomish silt loam, or Terric Medisaprists (nearly level), if drained and flood protected	Mukilteo muck, Puget Silty clay loam, Puyallup fine sandy loam, Snohomish silt loam, or Terric Medisaprists (nearly level), if not drained and flood protected	Other soils, if drained and flood protected	Other soils
Drainage System Required for Continued Agricultural Use	*How does the project's drainage system affect adjacent agricultural lands? What mechanism is used?*		Project worsens drainage in remaining agricultural areas; pumping required frequently	Project doesn't affect drainage on adjacent agricultural areas; pumping required occasionally	Project doesn't affect drainage on adjacent agricultural areas; all drainage by gravity, no pumping required	Project improves drainage on remaining agricultural areas
Effects on Archaeological, Historical, and Cultural Resources	*Presence of significant resources*	*Significant resources exist which cannot be altered*	Project may affect significant resources, but can be mitigated with great difficulty or cost	Project may affect significant resources, but can easily be mitigated	Project will not affect significant resources	Project will protect significant resources
Effects on Existing Flood Protection Infrastructure	*Will the project(s) cause erosion, sedimentation or slope stability issues for the existing dikes (i.e., will breaching one area cause stability issues for dikes in other areas?)*	*Project will cause major issues that cannot be mitigated*	Project will cause medium issues that can be mitigated, but it's relatively expensive to do so	Project will cause minor issues that can be easily mitigated	Project will not affect existing dikes	Project will improve dike stability

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Decision Factors	**Measurement**	**Deal Breaker**	**1 (lowest)**	**2**	**3**	**4 (highest)**
Feasibility of New Flood Protection Infrastructure	*Will soils support new dikes? Is it technically feasible to build new flood infrastructure?*	*New flood protection infrastructure cannot be built due to soils or other technical constraints*	New flood protection infrastructure can be built but with new, innovative materials or methods that may take decades to prove	New flood protection infrastructure can be built using standard materials and methods, but may take more than 10 years	New flood protection infrastructure can be built using standard materials and methods, but may take several years to allow for ground settling	New flood protection infrastructure can be relatively easily built using standard materials and methods
Economic Efficiency of Flood Protection Measures	*What effects will the project have on the Diking District's ability to maintain it's flood protection infrastructure? Changes can be measured as a change in ratio of length of dikes to land protected from flooding.*	*Ratio such that the district is no longer economically viable*	Change in ratio that adds significant cost for flood protection	Change in ratio that adds moderate cost for flood protection	Change in ratio that adds minor cost for flood protection	No change in ratio
Impacts on Utilities and Other Infrastructure	*Will the project have significant impacts on existing utility infrastructure?*	*Major utilities are present that cannot be relocated, maintained, or flood-proofed*	Major utilities are present that would be extremely difficult to relocate, maintain, or flood-proof	Major utilities are present that would be moderately difficult to relocate, maintain, or flood-proof	Minor utility infrastructure present, which can easily be relocated, maintained, and/or flood-proofed	No utility infrastructure present
Impacts on Road System	*What effects will the project have on roads?*	*Project will cause a state highway to need to be relocated*	Project will cause significant segments of major County arterials to relocated	Project will cause significant segments of County collector roads to be relocated	Project will cause loss of segments of public or private local roads that may or may not need to be replaced	Project will not cause any public or private roads to be relocated
Effects on Recreational Uses - Fishing	*What effects will the project have on fishing opportunities?*		Project would eliminate significant, and not provide any new, fishing opportunities	Project would eliminate some informal, and not provide any new, fishing opportunities	Project would not eliminate any, and would provide some informal, fishing opportunities	Project would not eliminate and, and would provide additional, significant fishing opportunities

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Decision Factors	**Measurement**	**Deal Breaker**	**1 (lowest)**	**2**	**3**	**4 (highest)**
Effects on Recreational Uses - Hunting/Shooting	*What effects will the project have on hunting and shooting opportunities?*		Project will eliminate existing hunting/shooting opportunities	Project would eliminate some informal, and not provide any new, hunting/shooting opportunities	Project would not eliminate any, and would provide some informal, hunting/shooting opportunities	Project would not eliminate and, and would provide additional, significant hunting/shooting opportunities
Effects on Recreational Uses - Boating	*What effects will the project have on boating opportunities?*		Project will eliminate existing boating opportunities	Project would eliminate some informal, and not provide any new, boating opportunities	Project would not eliminate any, and would provide some informal, boating opportunities	Project would not eliminate and, and would provide additional, significant boating opportunities
Effects on Recreational Uses - Hiking/Walking	*What effects will the project have on hiking and walking opportunities?*		Project will eliminate existing hiking/walking opportunities	Project would eliminate some informal, and not provide any new, hiking/walking opportunities	Project would not eliminate any, and would provide some informal, hiking/walking opportunities	Project would not eliminate and, and would provide additional, significant hiking/walking opportunities
Effects on Recreational Uses - Bird Watching	*What effects will the project have on bird watching opportunities?*		Project will eliminate existing bird watching opportunities	Project would eliminate some informal, and not provide any new, bird watching opportunities	Project would not eliminate any, and would provide some informal, bird watching opportunities	Project would not eliminate and, and would provide additional, significant bird watching opportunities
Other stakeholder concerns	*Other criteria as raised by the Advisory Committee (TBD)*					

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Pairwise Comparison/ Ranking of Decision Factors

Decision Factors	Size of Restored Area	Amount of Fish Habitat	Energetics/Exchange	Predicted long-term elevation distribution	Connectivity to Total Fish Population	Complexity and Diversity of Habitats	Influence by Adjacent Land Uses	Completeness of Restored Tidal Action	Other Species: Birds	Effects On or Due To Other Restoration Projects and Salmon Recovery Actions	Water quality	Current Use	Contiguity of Agricultural Land	Impacts of Restoration Project on Agricultural Uses	Soil Suitability for Agriculture	Drainage System Required for Continued Agricultural Use	Effects on Archaeological, Historical, and Cultural Resources	Effects on Existing Flood Protection Infrastructure	Feasibility of New Flood Protection Infrastructure	Economic Efficiency of Flood Protection Measures	Impacts on Utilities and Other Infrastructure	Impacts on Road System	Effects on Recreational Uses - Fishing	Effects on Recreational Uses - Hunting/Shooting	Effects on Recreational Uses - Boating	Effects on Recreational Uses - Hiking/Walking	Effects on Recreational Uses - Bird Watching	Other stakeholder concerns	Sum of Ranking
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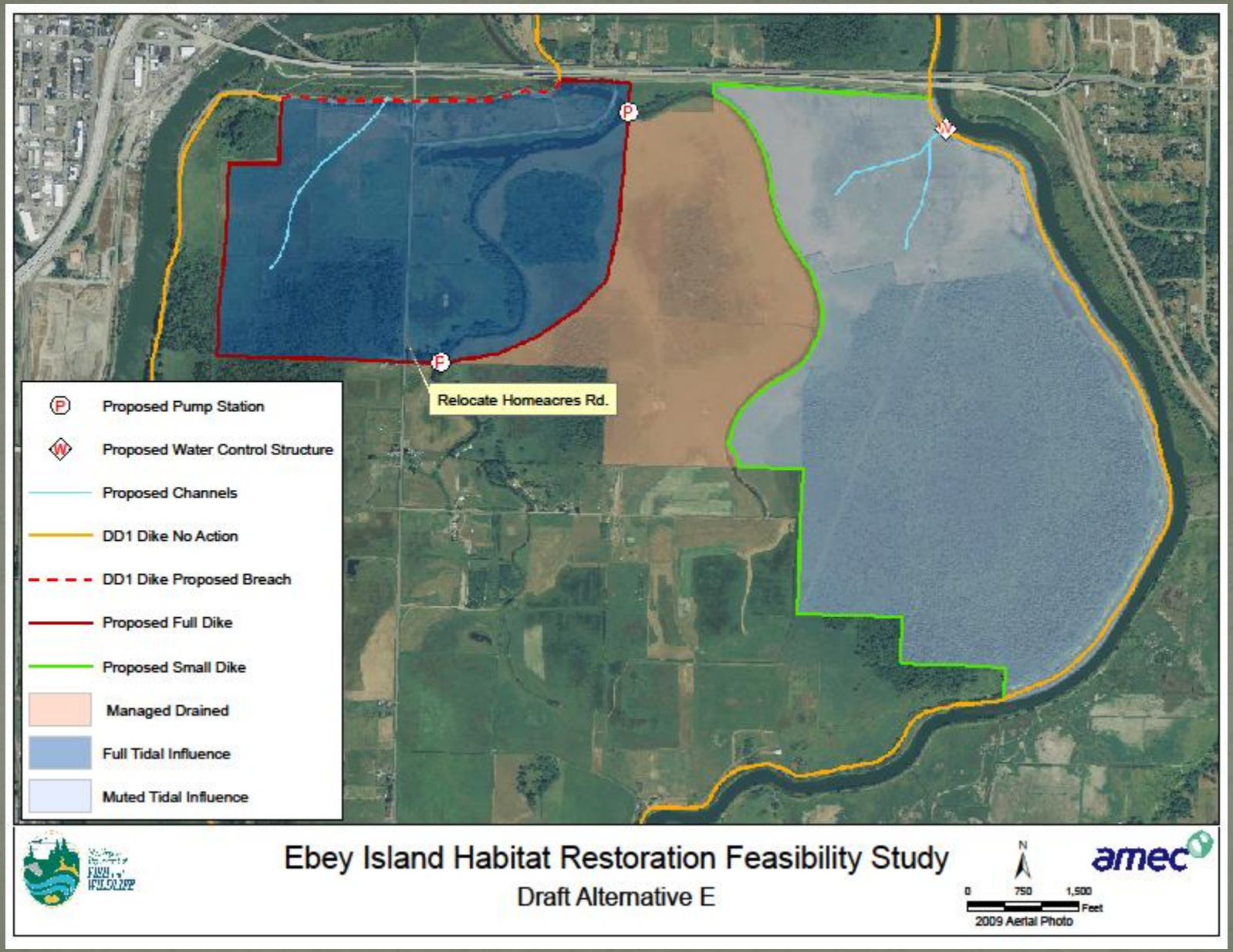
Total number of times factor checked																													
Rank (highest number checked = #1 rank)																													
Weighted Decision Factor (sum of all ranks and divide by the rank of the specific decision factor)																													


Relocate Homeacres Rd.
Proposed Pump Station
Proposed Water Control Structure
Proposed Channels
DD1 Dike No Action
DD1 Dike Proposed Breach
Proposed Full Dike
Proposed Small Dike
Managed Drained
Full Tidal Influence
Muted Tidal Influence
Ebey Island Habitat Restoration Feasibility Study
Draft Alternative E
N
0
750
1,500
Feet
2009 Aerial Photo
amec

Example – Alternative E

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Example (short) Score = 31